

Meeting Minutes-May 11, 2000
Construction Safety Advisory Committee
Department of Energy
Albuquerque, NM

Committee Chairperson, Pat Finn, Department of Energy-Headquarters (DOE-HQ), EH-51, called the meeting of the DOE Construction Safety Advisory Committee (CSAC) to order. Mr. Finn welcomed attendees and introductions were made.

Mr. Finn discussed the following events and issues that have occurred or developed since the last meetings.

DOE's Worker Health and Safety Response Line interpretations involving construction that have been completed since last year's CSAC meeting in Berkeley, CA were passed out to committee members. If anyone has any questions concerning the interpretations, please give Mr. Finn a call (301) 903-9876.

Mr. Finn attended OSHA's Advisory Committee on Construction Safety and Health (ACCSH) meeting on May 4 and 5, 2000 in Washington D. C. This committee meets to provide guidance to OSHA on its rulemaking, enforcement and outreach activities. A review of ongoing or proposed rulemaking efforts was conducted and a summary follows:

CFR Citation 1926: Fall Protection in the Construction Industry-OSHA has solicited input through public notice on fall protection issues impacting certain construction processes such as residential home building, pre-cast concrete operations and post frame construction. The ANPR also addresses the fall protection rule as it applies to roofing work, residential construction operations, climbing reinforcement steel, and vendors delivering materials to construction projects.

CFR Citation: 29 CFR 1926.450; 29 CFR 1926.451; S29 CFR 1926.452; 29 CFR 1926.453, 29 CFR 1926.454: Safety Standards for Scaffolds Used in the Construction Industry Part II – Since the promulgation of a final rule for scaffolds used in construction in August 1996, several issues have arisen under the new standard. The agency will solicit information on issues including providing access to platforms where decking extends past the ends of the scaffold, changing the minimum width for roof brackets to less than 12 inches, changing the requirement for grounding of the scaffold during welding operations, and requiring the use of scaffold grade planks.

CFR Citation 1926.52: Hearing Loss Prevention for Construction Workers-OSHA issued a standard mandating a comprehensive hearing conservation program for noise exposed workers in general industry in 1983. However, a number of recent studies have shown that a large number of construction workers experience work-related hearing loss. In addition, current industry practice with regard to the use of engineering, administrative and personal protective equipment to reduce exposure to

noise is low in the construction industry. OSHA intends to initiate stakeholder meetings to gather information on the extent of noise-induced hearing loss among workers in different construction trades, current practices to reduce this loss, and additional approaches and protections that could be used to prevent such loss in the future.

CFR Citation CFR 1910, CFR 1926, CFR 1915, CFR 1916, CFR 1917, CFR 1918: Occupational Exposure to Crystalline Silica-Silica exposure remains a serious threat to nearly 2 million U.S. workers, including more than 100,000 workers in high risk jobs such as abrasive blasting, foundry work, stonecutting, rock drilling, quarry work and tunneling. The seriousness of the health hazards associated with silica exposure is demonstrated by the fatalities and disabling illnesses that continue to occur in sandblasters and rock drillers and by recent studies that demonstrate a statistically significant increase in lung cancer among silica exposed workers. Additionally, recent studies suggest that the current OSHA standard is insufficient to protect against silicosis. OSHA plans to publish a proposed rule on crystalline silica to protect silica-exposed workers in general industry, construction and maritime.

CFR Citation: 29 CFR 1926.200; 29 CFR 1926.201; 29 CFR 1926.202; 29 CFR 1926.203: Signs, Signals, and Barricades – OSHA’s standard on Signs, Signals and Barricades currently incorporates the American National Standards Institute’s (ANSI) 1971 industry consensus standard ANSI D6.1 1971. The ANSI organization has withdrawn its 1971 standard and the U. S. Department of Transportation has issued an updated standard, a Manual on Uniform Traffic Control Devices (MUTCD). OSHA intends to issue a proposal to update Subpart G to incorporate the requirements of the Department of Transportation’s MUTCD into the OSHA rule.

CFR Citation: 29 CFR 1926.750 (Revision); 29 CFR 1926.751 (Revision): 29 CFR 1926.752 (Revision): Steel Erection (Part 1926 Safety Protection for Ironworkers) – In 1992, OSHA announced that it would develop a proposal for revising steel erection safety requirement using the negotiated rulemaking process. In negotiated rulemaking, OSHA, industry and employee representatives meet as an advisory committee and attempt to forge a consensus on the proposed standard. An advisory committee for this rule was formed in 1994. Its work resulted in the publication of a proposed rule on August 13, 1998. A public hearing was held in Washington, D. C. in December 1998. The post hearing comment period closed April 12, 1999. OSHA is now working to complete a final rule.

CFR Citation: 29 CFR 1910.132; 29 CFR 1915.152; 29 CFR 1917.96; 29 CFR 1918.106; 29 CFR 1926.95: Employer Payment for Personal Protective Equipment- OSHA standards require that protective equipment, including personal protective equipment (PPE) be provided and used when necessary to protect employees from hazards that can cause them injury, illness, or physical harm. OSHA is proposing to revise its PPE standards to clarify who is required to pay for required PPE and under what circumstances. According to the proposal, employers would be required to provide all OSHA-required PPE at no cost to employees, with the following

exceptions: the employer would not pay for safety-toe protective footwear or prescription safety eyewear if all three of the following conditions are met: (1) the employer permits such footwear or eyewear to be worn off the job-site; (2) the footwear or eyewear is not used in a manner that renders it unsafe for use off the job-site (for example contaminated safety-toe footwear would not be permitted to be worn off the job-site); and (3) such footwear or eyewear is not designed for special use on the job.

CFR Citation: 29 CFR 1910.134; 29 CFR 1915.152; 29 CFR 1918.102; 29 CFR 1926.103: Respiratory Protection (Proper use of Modern Respirators) – OSHA published the final respiratory protection standard, except for the reserved provision on assigned protection factors (APFs). APFs are numbers that estimate the degree of performance of the various classes of respirators. OSHA has developed a statistical model for analyzing available data that will be used to derive APFs. According, OSHA will request further public comment on the analyses conducted using their statistical model, the ANSI Z88.2-1992 APFs, the NIOSH Respirator Decisions Logic APFs and other relevant methods for deriving APFs. This will assure that OSHA receives and fully considers public input before issuing APFs. OSHA expects to complete rulemaking on APFs in 2000.

Confined Spaces in Construction (Part 1926): Preventing Suffocation/Explosions in Confined Spaces – In January 1993, OSHA issued a general industry rule to protect employees who enter confined spaces (29 CFR 1910.146). This standard does not apply to the construction industry because of differences in the nature of the worksites in the construction industry. In discussions with the United Steel Workers of America on a settlement agreement for the general industry standard, OSHA agreed to issue a proposed rule to extend confined-space protection to construction workers appropriate to their work environment. One million construction workers are exposed to the hazards of confined space entry each year. OSHA intends to issue a proposed rule addressing this construction industry hazard next year.

CFR Citation: 29 CFR 1910.136; 29 CFR 1910.137; 29 CFR 1910.269; 29 CFR 1926.97; 29 CFR 1926.950 to 968: Electric Power Transmission and Distribution; Electrical Protective Equipment in the Construction Industry – The annual fatality rate for power line workers is over 50 deaths per 100,000 employees. The construction industry standard addressing the safety of these workers during the construction of electric power transmission and distribution lines is over 20 years old. OSHA is developing a revision of this standard that will prevent many of these fatalities, that will add flexibility to the standard, and that will update and streamline the standard. In addition, OSHA intends to amend the corresponding standard for general industry so that requirements for work performed during maintenance of electric power transmission and distribution installations are the same as those for similar work in construction.

Safety and Health Programs for Construction-In response to industry requests and in response to the recommendation of OSHA's ACCSH, OSHA has determined that the

current safety and health program standards contained in subpart C of the construction standards, 29 CFR 1926, need to be revised to provide construction employers with a more comprehensive set of requirements to assist them in establishing safety and health programs. Although OSHA is still developing the details of a new proposed safety and health program standard, the proposal will require employers to set up a program for managing workplace safety and health in order to reduce the incidence of occupational deaths, injuries, and illnesses. The Standard will not impose duties on employers to control hazards that they are not already required to control. Instead, the standard will provide a basic framework for systematically identifying and controlling workplace hazards already covered by the OSH Act under section 5(a)(1) and current OSHA standards.

CFR Citation 29 CFR 1926: Control of Hazardous Energy (Lock Out-Tag Out) in Construction-OSHA issued a general industry rule on September 1, 1989 to address the hazards posed to workers by the failure to control hazardous energy (i.e., the failure to properly lockout or tagout machines and equipment) during repair and servicing activities. OSHA has not yet issued a standard to prevent these accidents during equipment repair and maintenance activities in the construction industry. Four million workers annually may be exposed to this hazard in construction workplaces. Construction sites often do not have effective lockout/tagout procedures to control hazardous energy because of several factors, all associated with the nature of the construction industry. These factors basically related to the types of machines and equipment found in construction; the makeup of the industry (i.e., employment is relatively “short term,” lasting only as long as the length of the current project); multiple employers having different employer/employee relationships are present at the same site; and “in-the-field” maintenance activity is usually temporary. OSHA intends to issue a proposal to address this hazard in the industry.

CFR Citation: 29 CFR 1910; 29 CFR 1915 to 1918; 29 CFR 1926; 29 CFR 1928: Consolidation of Records Maintenance Requirements in OSHA Standards-OSHA is initiating a rulemaking to simplify and consolidate many of its requirements for employers to maintain records of training, testing, medical surveillance, and other activities conducted to comply with OSHA health and safety standards. These records maintenance requirements appear in many OSHA standards and are codified at 29 CFR 1910 (General Industry), 29 CFR 1915 - 1918 (Maritime), 29 CFR 1926 (Construction), and 29 CFR 1928 (Agriculture). The final rule, when published, will facilitate compliance with these requirements and reduce the amount of paperwork associated with these records, but will leave employee protections unchanged.

ANSI A10 Standards Action: Mr. Finn, a member of the ANSI A10 Committee on Safety in Construction and Demolition Operations, sent out two revised standards to the CSAC members for review. Committee members were sent copies of standards A10-16 *Tunnels, Shafts and Caissons* and A10-31 *Digger Derricks*. Committee members were reminded to review and comment on the two documents and send comments to Mr. Finn.

Mr. Russ Baumeister, DOE-Yucca Mountain Site Characterization Office, gave a presentation on *Analyzing Skill of the Craft Worker for ISM Verification*.

Definition: Skill of the Worker (SOW) shall be identified as those skills that come from the five following areas:

1. Education and field experience which qualifies a person as a specialist in a particular field. This includes states local or national licenses or certifications earned from various governmental licenses, professional organizations, industry standard certificates etc.
2. Craft union Apprenticeship Training.
3. On the Job Training (OJT) received at Yucca Mountain Project (YMP), or other documented OJT.
4. Documented specialized training received while employed outside YMP.
5. The skill acquired from years working as a Journeyman skilled craftsman.

No work instructions are required for activities identified as Skill of the Worker if they meet the following requirements:

1. The work tasks are routine and present no level of risk.
2. Do not require documented work history or configuration management.
3. Are specified in attachments or other written work instructions.
4. Meet the above criteria and are controlled by existing procedures.

Mr. Dave Robbins, Brookhaven National Laboratory (BNL), gave a presentation on *“Qualifying Contractors for Bid.”*

Prior BNL contracting practice:

1. Free and open bidding
2. Low bid
3. High fear factor of contractor reprisal
4. Little recourse for poor performance

New BNL contracting process; Fair and Open Bidding, not Free and Open Bidding

1. BNL contractor evaluation committee pre-determines a select group of "qualified" contractors to participate in the bidding process.
2. Contractors are pre-qualified for a period of 2 years. Being qualified does “not” grant automatic award for lowest bidder.
3. Performance “history” from prior and ongoing projects may disqualify a bidder.

4. Committee evaluation includes contractor history generated from several means.
5. review of prior and ongoing projects.
6. interviews with previous customer project personnel, insurance and OSHA record keeping data.

Benefits include:

- Levels the “playing field” for responsible contractors to provide quality product at a reasonable profit.
- Less need for contractor to be compelled to seek change orders or other sources of additional revenue.
- Qualification submittals are reviewed every two years vs. every project.
- Reviews focus on project-specific criteria, not generic corporate policy.
- Contractors managing safety and health deliverables along with managing quality, budget and schedule deliverables.

Mr. Rich Haddock, DOE Oakland Operations Office, gave a presentation on the **"Lessons Learned"** from a Back Injury Accident at the National Ignition Facility. An employee of the mechanical contractor installing duct work at the National Ignition Facility project suffered a serious injury when the hoist support lumber failed. When the lumber support member fractured, the hoist load (duct) fell to the work platform floor, striking the worker. This resulted in the worker sustaining back contusions and three fractured vertebrae.

The accident investigation resulted in identification of Direct Cause, Contribution Causes, Root Causes and Judgements of Need.

Direct Cause: Less than adequate rigging support. The hoist support lumber failed due to the imposed excessive bending moment.

Contribution Causes: Work planning was less than adequate in that the mechanical subcontractor crew foreman did not ensure that an adequate installation procedure (supported by an accepted Job Hazard Analysis) was used to install the duct, ES&H evaluation process was less than adequate in that the process that was being used was not in accordance with the Construction Safety Plan (CSP), worker training was less than adequate in that the mechanical subcontractor foreman and his crew were conducting hoisting and rigging operations without the proper training, qualification, and authorization, the activity assessment program was less than adequate in that all three contractors did not effectively employ supervisors and ES&H personnel to observe all of the construction operation and enforce sound safety practices.

Root Cause: Work performance was less than adequate in that the mechanical subcontractor worker did not follow established hoist safety requirements, ES&H evaluation process was less than adequate in that the Job Hazardous Analysis (JHA)

for this work was required but not conducted, there was less than adequate supervision and oversight of work from the subcontractor senior foreman up to and including Lawrence Livermore National Laboratory (LLNL) Program Management.

Judgments of Need: Management's safety challenge in a project of this magnitude is to establish and maintain a construction site safety culture, which is so strong, effective, and pervasive that it overcomes any of the participating contractor safety shortfalls, a need exist to develop and implement, an improved hazards analysis procedure, a safety training program for all contractor managers down to and including first level supervisors such as foreman, an improved policy for to enforcing safety requirements on the construction site, a project construction site Safety and Quality Assurance Plan, a hoisting and rigging safety program, a revised Construction Safety Management Plan with appropriate support staffing, a need exists to significantly increase LLNL Program Management's physical presence at the construction site.

Mr. Craig Schumann, DOE Chicago Operations Office, gave a presentation on *Aerial Lift Tie-Off Requirements*. The requirements found in OSHA 1926.453 apply to aerial work platforms (AWP) covered in ANSI A92.2 *Vehicle-Mounted Elevating and Rotating Aerial Devices*. Listing of all ANSI Aerial Work Platforms Standards included: ANSI A92.2 Vehicle Mounted Elevating and Rotating Aerial Devices, ANSI A92.3 Manually Propelled Elevating Work Platforms, ANSI A 92.5 Boom-Supported Elevating Work Platforms, ANSI A92.6 Self-Propelled Elevating Work Platforms, ANSI A92.7 Airline Ground Support Vehicle-Mounted Vertical Lift Devices, ANSI A92.8 Vehicle-Mounted Bridge Inspection and Maintenance Devices, ANSI A92.9 Mast-Climbing Work Platforms.

The following is a summary of a copy of an article that was distributed to the committee that was published in the Scaffold Industry Association newsletter. Fall-protection regulations found in OSHA 29 CFR 1926, Subpart M do not and should not apply to AWP. Subpart M addresses guarding unprotected edges. AWP do not have unprotected edges. Most of the confusion and misinformation surrounding this topic is due to the attempt to apply concepts developed for "free-fall" and "arresting free falls" in subpart M to AWP. However, ejection from a boom-type platform is the major safety issue relating to fall protection in AWP. Guardrails totally enclose the platform and guard against exposed-edge-type falls. Guardrails provide adequate protection against fall hazards other than catapulting forces. On boom-type machines, a tethering device is needed so those workers are not separated from the AWP in the event of a catapulting action. Self-Propelled Elevating Platforms (ANSI A92.6) require no additional fall protection beyond a guardrail system. The A92.6 lifts are tower-like structures and do not produce catapulting forces thus should be considered similar to scaffolding with guardrails.

OSHA is intending to issue a letter of interpretation addressing aerial lifts covered in 29 CFR 1926 subpart L. The interpretation will state: No additional fall protection beyond the guardrail system is required for a self-propelled AWP as described in

ANSI A92.6 and manually propelled AWP as described in ANSI A92.3. A tether must be worn on boom type machines described in ANSI A92.2 and A92.5. These devices are to keep a worker from completely separating from a workbasket should there be a catapulting of the boom, which propels the worker upward. The issue is not one of free fall but rather launching. The tethering device is not to be confused with personal fall arrest, position or restraint devices covered in 29 CFR 1926 subpart M 1926.502(e). The tether should be of sufficient length to allow free access to the work area with minimal slack. A tethering device consists of a belt or harness and lanyard. Adjustable lanyards or other devices may be used to minimize tether slack.

Mr. Bryan Drennan, Sandia National Laboratory, gave a presentation on **"Lessons Learned"** from a Construction Accident at Sandia National Laboratory (SNL). The accident involved the installation of the hydraulic system for an elevator. The 12" PVC liner had been installed the day before. Two-piece steel jack casing was screwed together and was lowered half way into the 12" PVC liner. A welder began to arc weld the coupling on the casing when an explosion occurred. Accident investigation findings:

Direct Cause: Flammable atmosphere ignited by welding slag.

Root Cause: SNL Project Team failed to incorporate specific requirements from Project Execution Plan (PEP), elevator contractor failed to plan, identify, and control the project, SNL FESH failed to use appropriate change control process.

Contributing Causes: DOE did not verify terms of the PEP incorporated into the construction contract, SNL Project Management Team did not comply with PEP requirements, prime and subcontractor used a "generic" hazard analysis for this task, subcontractor did not provide adequate training to the "probationary help/welder" to recognize hazards.

Lessons Learned-Integrated Safety Management System concepts:

Plan the Work: Contract change processes need clear definition and incorporation of all concerned personnel prior to implementation, clear understanding of equipment procurement by contractor/subcontractor needs to be communicated, employer responsible for the task must establish and implement a formal hazard analysis and communication process.

Analyze the Hazards: The prime and subcontractors must implement a task specific hazard analysis prior to doing work, prime contractor must accept responsibility for the oversight of subcontractor implementation of their hazard analysis process.

Control the Hazards: SNL Project team cut the original conception of requiring a "Full Time Safety Officer" by the prime contractor, prime and subcontractor did not recognize or control the hazards associated with elevator installations.

Perform the Work: The elevator subcontractor did not adequately prepare its workers for the hazards associated with this work (utilization of the site-specific installation specifications and the employee handbook), the elevator subcontractor foreman did not refer to instructions in the elevator system installation manual or direct workers involved with the system to do so.

Feedback and Improvement: The construction contract between SNL and the prime contractor should have more clearly defined the prime contractor responsibility over their subcontractors, the “generic” hazard analysis did not adequately identify hazards present in this task, the subcontractor failed to identify the hazards associated with the work activity.

Mr. Craig Schumann, DOE Chicago Operation Office, gave a presentation on *Safety Concerns with Horizontal Directional Drilling*.

Trenchless Technology: Horizontal directional drilling (HDD) is a form of trenchless technology. ● HDD is sometimes called horizontal directional boring.

Benefits: Install all kinds of pipes and lines without excavating, can be used for a variety of installations including electric, telephone, fiber-optic, gas, water and sewer lines, no disruption of residents, traffic or any detrimental effect on landscapes or buildings.

Biggest challenge: Lack of adequate site surveys before drilling – hazard of drilling into unmarked utilities.

Key Safety Reminders: 20 kV boots and gloves (for both the operator and the locator). ● Location of existing utilities, during drilling, the locator should step away from the drill head (6 feet). In the event of a strike, the locator would not be standing over the top of the drill head in a potentially dangerous position, the machine has rotating shaft hazard, loose clothing should not be worn, operable interlock on the seat so the machine will not run unless the person is seated, good communications between the operator and the locator (2 way radio preferred)

Mr. Robert Stroud, DOE Oakland Operations, gave a presentation on *East Tennessee Technology Part Three-Building D&D and Recycle Project*.

Project Description: D&D three buildings filled with gaseous diffusion process equipment contaminated or potentially contaminated with uranium and other hazardous material. The project is performed as a CERCLA Non- Time Critical Removal Action. Contracting method was a Fixed-Price contract. Project Safety Basis Document established Work Smart Standards including: CFR’s, TN/EPA Agreement, DOE Orders, Consensus Standards.

Contractor Safety Basis Documents: Integrated Safety Management Plan, Radiation Protection plan, Quality Assurance Plan, Waste Management Plan, Emergency Preparedness Plan, Material Control and Accounting Program Plan, Removal Action

Work Plan, Radiological Material Release/Transfer Procedure, Building D&D Verification Procedures.

Lessons Learned: Identify, collect and provide historical facility related documentation to D&D Contractor, transmit documentation formally, develop robust set of Work Smart Standards, require project schedule with critical path identified, develop comprehensive, mutually agreed, performance metrics, develop and document understanding of expectation for ESH&Q rigor, make no assumption concerning facility condition, be quantitative not qualitative, define operability, use pre-production research before determining methods for accomplishment, understand the operational aspects of D&D, don't assume D&D contractor will share DOE's management paradigms.

Mr. Jack Heier, DOE Idaho Operations, discussed a Department of Justice News Release, *Idaho Man Given Longest-Ever Sentence for Environment Safety Crime*. In the longest sentence ever imposed for an environmental crime, a federal judge ordered an Idaho man to serve 17 years in prison for his crimes that left a 20-year old employee with permanent brain damage from cyanide poisoning. The defendant, Allan Elias, also was ordered to pay \$6 million in restitution to the victim and his family. In May 1999, a jury in Pocatello, Idaho, found that Elias ordered employees of Evergreen Resources, a fertilizer manufacturing company he owned, to enter and clean out a 25,000-gallon storage tank containing cyanide without taking required precautions to protect his employees. OSHA inspectors repeatedly had warned Elias about the dangers of cyanide and explained the precautions he must take before sending his employees into the tank, such as giving workers protective gear. The employee was overcome by hydrogen cyanide gas while cleaning the tank and sustained permanent brain damage as a result of cyanide poisoning. Mr. Heier had previous experience with Mr. Elias and Evergreen Resources earlier in his career as an OSHA compliance officer and was subpoenaed by the prosecution to testify in this case. Though Mr. Heier was not called upon to testify, he recounted to the committee past experience of poor safety and health performance on the part of this contractor.

Mr. Finn adjourned the meeting at 4:30 p.m.